

Response Under 37 CFR 1.116

Expedited Procedure

Examining Group 1712

Application No. 10/644,791

Paper Dated: February 24, 2006

In Reply to USPTO Correspondence of January 5, 2006

Attorney Docket No. 3833-030392

REMARKS

These remarks are submitted as a request for reconsideration and will be reiterated upon appeal if allowance of the pending claims is not forthcoming.

I. REAL PARTY IN INTEREST

Henkel Loctite Corporation is the Assignee of the entire right, title and interest in the above-identified application, as evidenced in the Assignment recorded August 19, 2003 at Reel 014423, Frame 0698, and, as such, is the real party in interest in this application.

II. RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences known to Applicants, Applicants' legal representative or Assignee, which will directly affect, or be directly affected by or having a bearing on, a decision in the present application.

III. STATUS OF CLAIMS

Claims 1-15 and 25-27 are pending in the present application.

IV. STATUS OF AMENDMENTS

No amendments to the claims are made herein.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention includes a flame retardant molding composition that is substantially free of halogen, antimony and phosphorous, per Para. [0008] of the application as filed. The molding composition includes an epoxy resin, melamine cyanurate and a transition metal oxide of a Group VIA element. Para. [0009].

The present invention also includes a flame retardant molding composition substantially free of elemental halogen, phosphorous and antimony that includes about 4-12 wt.% epoxy resin, 0.1-3.5 wt.% melamine cyanurate, 0.1-2 wt.% tungsten trioxide, 0.001-10 wt.% phenolic hardener and 10-85 wt.% of a filler material, each of these weight percentages being on the basis of the total weight of the composition. Paras. [0020] (amount of resin), [0021] and [0023] (amount of

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phenolic hardener), [0026] (amount of melamine cyanurate), [0027] (amount of WO₃), and [0029] (amount of filler). Alternatively, the flame retardant molding composition may include, instead of a phenolic hardener, an anhydride hardener in the same amounts of 0.001-10 wt.%. Para. [0021].

VI. PRIOR ART REJECTIONS

Claims 1-27 stand rejected under 35 U.S.C. §103(a) for obviousness over U.S. Patent No. 6,432,540 to Gallo and Japanese Patent Nos. 11-269347 and 10-212396 in view of Japanese Patent No. 11-100492.

Claims 1-27 stand rejected under 35 U.S.C. §103(a) for obviousness over JP '492, in view of the Gallo patent and JP '347.

These rejections of claims 1-27 are understood to apply to the pending claims 1-15 and 25-27.

VII. ARGUMENT

A. The use of JP '492 as a secondary reference with the primary references is inappropriate because there is no suggestion of the desirability of combining their teachings.

The final Office Action notes that the primary references teach using certain transition metal oxides as flame retardants: tungsten trioxide (Gallo patent at col. 4, lines 35-37) and molybdenum oxide or tungsten oxide (JP '347, pg. 4, par. 11, lines 1-6 and JP '396, pg. 2, par. 11). None of these three primary references teach or suggest including an organic flame retardant (such as melamine cyanurate) with the transition metal oxides. The secondary reference of JP '492 is relied upon for supposedly teaching the use of melamine cyanurate together with a metal oxide (NiO, not a transition metal oxide) in order to improve the properties of the resulting composition in addition to fire resistance.

The final Office Action asserts that it would be obvious to include melamine cyanurate with the compositions of the primary references "in order to impart solder thermal resistance". While JP '492 discloses using melamine cyanurate as a flame retardant, it does not teach so doing to impart solder thermal

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resistance. The Office Action also asserts that "[t]he motivation to incorporate the melamine cyanurate of JP '492 into the blends of the primary references is entirely consistent with the objectives thereof". This ability to combine references does not render the resultant combination obvious, unless there is some suggestion for the desirability of doing so. MPEP §2143.01. As detailed hereinafter, the Examiner has not made out a *prima facie* case of obviousness in combining JP '492 with the three primary references since there is no motivation disclosed in any of the references for including the melamine cyanurate that is disclosed in JP '492 with the flame retardant compositions disclosed in the Gallo patent, JP '347 or JP '396.

(1) JP '492 does not teach a benefit of including a metal oxide with melamine cyanurate in a flame retardant composition.

JP '492 discloses using organic flame retardants (with optional metal oxide flame retardants) in an epoxy resin composition. The reference only considers that certain inorganic fire retardants may be optionally included as components. These optional fire retardants may be metal oxides and metal hydroxides. Nowhere does the reference appreciate that a Group VIA transition metal oxide provides improved flame retardant characteristics.

Metal hydroxides function as flame retardants by decomposing and producing water when exposed to heat. A transition metal oxide does not accomplish such a function. Therefore, one skilled in the art would not be motivated to substitute the tungsten trioxide of Gallo with the optional metal hydroxide taught by JP '492.

The only metal oxide that is disclosed in JP '492 is nickel oxide, which is an oxide of a Group VIIIB element. Nowhere does JP '492 suggest that including another component to the melamine cyanurate will result in a significantly improved flame retardant composition. Para. 23 of JP '492 explains that an excessive amount of organic flame retardant reduces heat resistance. The statement in the Office Action that JP '492 teaches "incorporating a melamine cyanurate together with a metal oxide in order to impart solder thermal resistance along with fire resistance"

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mischaracterizes its teachings. JP '492 teaches using a controlled amount of an organic flame retardant to maintain solder thermal resistance. It does not teach adding a metal oxide along with melamine cyanurate to impart solder thermal resistance. The reference only indicates that inorganic fire retardant agents may be included as optional components of a fire retardant agent.

(2) JP '492 demonstrates that melamine cyanurate alone is sufficient for providing flame retardant properties to an epoxy resin composition.

The Examples and Comparison Examples of JP '492 elucidate this point. Examples 6 and 7 included both melamine cyanurate and inorganic fire retardant agents; namely, Mg(OH)₂ and NiO. Examples 8 and 9 used only melamine cyanurate. As reported in Table 3, there was no difference in the flame retardant properties between Examples 6-9 that included melamine cyanurate alone or with inorganic components. Moreover, the Examples without an inorganic component (8 and 9) exhibited generally better flow properties (150 and 230 poise vs. 200 and 250 poise) and identical solder thermal resistance to Examples 6 and 7 which used inorganic flame retardants. These Examples 6-9 show that the inorganic flame retardants provided insignificant benefit to the compositions.

Contrary to these inconclusive results reported in JP '492 that a metal oxide (NiO) has no significant effect on a flame retardant composition containing melamine cyanurate, Applicants have demonstrated a synergistic effect of using melamine cyanurate and a transition metal oxide as flame retardants in a molding composition. See the Declaration Under 37 C.F.R. §1.132 submitted April 12, 2005.

The Examiner has cited no objective reason to combine the teachings of JP '492 with those of the primary references. Since JP '492 does not report any improvement achieved when melamine cyanurate is used in combination with nickel oxide as a flame retardant, there is no motivation provided by any of the references for modifying the teachings of the Gallo patent or JP '397 or JP '396 to include melamine cyanurate along with the Group VIA transition metal oxides disclosed therein. The Gallo patent, JP '347 and JP '396 all already contain flame retardants in

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the form of Group VIA transition metal oxides. Nothing in JP '492 indicates that a transition metal oxide should be used as a flame retardant or suggests any improved results that might occur if melamine cyanurate was included therewith. As such, claims 1-15 and 25-27 define over the combined teachings of the Gallo patent with JP '347, JP '396 and JP '492.

B. No motivation exists in the cited references for replacing the nickel oxide of JP '492 with the tungsten trioxide of Gallo or JP '347.

In the rejection based on JP '492, the Gallo patent and JP '347, the Examiner asserts that it would be obvious to use the WO_3 of Gallo and JP '347 as the "metal oxide" disclosed in JP '492. The asserted motivation is to improve the moisture resistance of the epoxy composition and to improve the balance between fire retardance and hardenability.

At col. 1, lines 28-32, Gallo states that phosphorous containing compounds are undesirable in that they tend to have a high moisture absorption rate. Hence, Gallo teaches at col. 5, lines 49-51 that transition metal oxides are substitutes for phosphorous containing compounds because they do not increase the rate of moisture absorption. Nothing in Gallo would suggest that a transition metal oxide should be substituted for a metal oxide (NiO). The moisture resistance of Gallo comes from avoiding a phosphorous-containing compound. There is no motivation to substitute the NiO of JP '492 by the Gallo transition metal oxide. Just because both references describe using some type of metal oxides, their teachings are not necessarily combinable without some motivation to do so. MPEP §2143.01. Actually, JP '492 teaches that phosphorous-containing compounds are suitable at Para. [0016]. Therefore, these divergent teachings of Gallo and JP '492 render them uncombinable.

The Examiner asserts that motivation for balancing fire retardance and hardenability is found in JP '347, which indicates that low amounts of MO or ZnO reduce fire retardancy and higher amounts thereof negatively impact hardenability. This teaching in JP '347 does not suggest that WO_3 is a substitute for the NiO flame

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retardant disclosed in JP '492. It only indicates that the amount of transition metal oxide should be controlled at a particular level to control properties. In fact, JP '357 indicates that the oxide may be an oxide of zinc, tin or transition metals, including molybdenum and tungsten. It does not suggest that a transition metal oxide is preferable over a metal oxide such as the nickel oxide disclosed in JP '492. The reference gives no motivation to replace the NiO of JP '492 with a transition metal oxide. The mere opportunity to combine references does not establish obviousness to do so.

Again, while JP '347, the Gallo patent and JP '492 all relate to flame retardant compositions, in the absence of some motivation to alter the teachings of JP '492, the *prima facie* case of obviousness of claims 1-15 and 25-27 has not been established.

VIII. CONCLUSION

In view of the foregoing, reconsideration of the rejections of claims 1-15 and 25-27 is respectfully requested. Allowance of pending claims 1-15 and 25-27 is respectfully requested.

Respectfully submitted,

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